

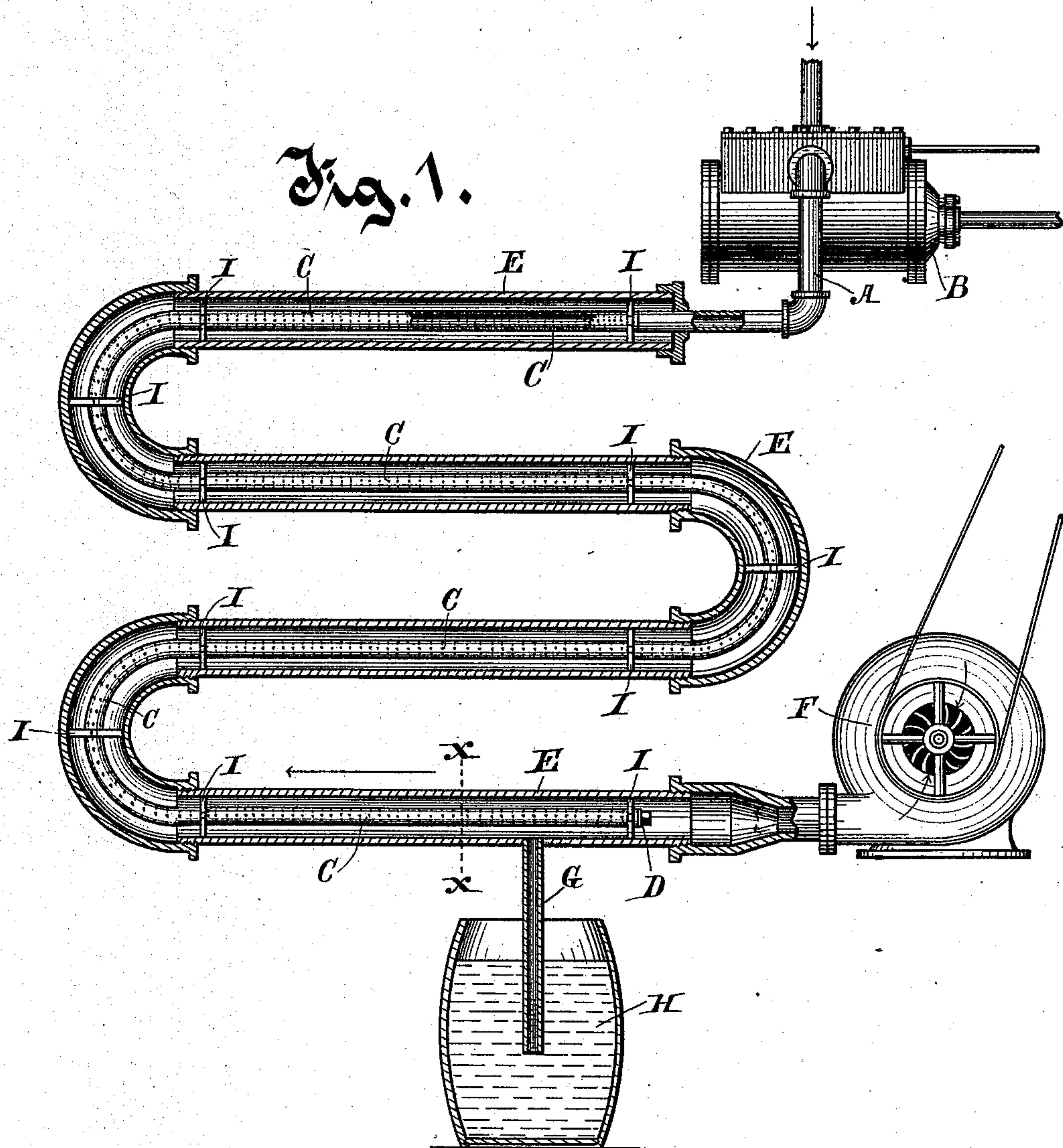
(No Model.)

E. DEDERICK.

CONDENSER.

No. 412,733.

Patented Oct. 15, 1889.

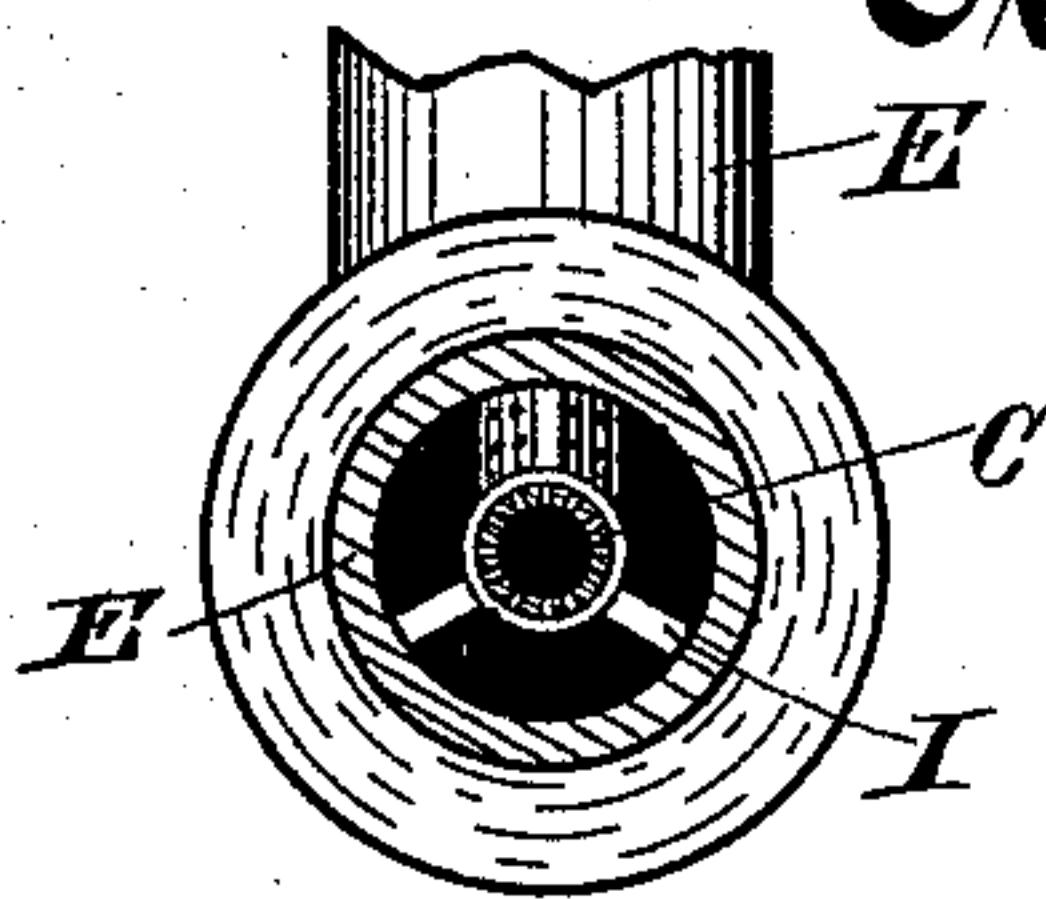


Witnesses.

*C. H. Keeney,*

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Fig. 2.



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# UNITED STATES PATENT OFFICE.

EZRA DEDERICK, OF MILWAUKEE, WISCONSIN.

## CONDENSER.

SPECIFICATION forming part of Letters Patent No. 412,733, dated October 15, 1889.

Application filed April 11, 1889. Serial No. 306,872. (No model.)

*To all whom it may concern:*

Be it known that I, EZRA DEDERICK, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Condensers; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

The object of my invention is to provide means for condensing exhaust-steam discharged from the cylinders of a steam-engine or of a locomotive.

In the drawings, Figure 1 is a perspective view of my complete device shown in connection with the cylinder and steam-chest of an engine, a portion of the device being in section to show the interior construction. Fig. 2 is a transverse vertical section on line X X of Fig. 1, looking in the direction of the arrow.

In the drawings, A is the exhaust-pipe leading from the steam-cylinder B of an engine, which exhaust-pipe is continued for considerable distance from the cylinder, and may be in serpentine, coiled, or other form, and is provided with a great number of apertures C C, by which the pipe is thoroughly perforated for considerable distance, the extreme end of the pipe being closed, as shown at D. An inclosing pipe or case E is placed steam-tight about the pipe A throughout all that part of the pipe which is perforated, this outside case being considerably larger in diameter than the pipe A, whereby a chamber is formed about the pipe A within the case. At the outer end of the case E a blower F is located, which is connected air-tight with the case, and which is adapted to blow air into the case around the perforated exhaust-pipe. Any other form of blower, or even a properly-constructed air-pump, might be used instead of the rotating blower shown in the drawings; but this form of blower is deemed the most desirable to use. At some point in the case E, and preferably at or near its lowest part, a vent or outlet pipe G is inserted in the case, the outer end of which terminates in a supply of water in a tank H. It is convenient

to locate the outlet-pipe at the lowest part of the case E, so that it may, if need be, serve also for a drip-pipe, and if located elsewhere, as it may be, a small drip-pipe can, if desired, be put into the case at the lowest point to dispose of condensed water. The case E is held in position with reference to the pipe A by means of stay-rods I I, secured to the pipe A and bearing against the inner surfaces of the case E. It will be understood that as the exhaust-steam passes into this pipe A it is discharged through the apertures C C, being thereby broken up into little jets, and in this form is rapidly condensed, thereby to some extent forming a vacuum in the case E, and that at the same time the blower F being in operation will force a supply of air into the case E, which is adapted to greatly increase the rapidity of condensation of the steam, and at the same time to overcome the vacuum formed by the condensation, whereby the condensation is made very rapid and very complete. As the outlet-pipe terminates in water, no steam or air, unless under considerable pressure, will escape therethrough.

For use with a locomotive the form of this device would have to be considerably changed, but the same elements and general structure would be preserved.

What I claim as new, and desire to secure by Letters Patent, is—

The combination, with a perforated steam-exhaust pipe leading from the cylinder of an engine, of a steam-tight case inclosing the exhaust-pipe throughout all that part of the pipe that is provided with perforations, an air-blower located in a case having an opening for receiving air, and a duct leading into the inclosing-case for forcing air into the inclosing-case about the perforated exhaust-pipe, and a supply of water in which the drip-pipe terminates, which drip-pipe leads from the inclosing-case at or near its lowest point, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EZRA DEDERICK.

Witnesses:

C. T. BENEDICT,  
ANNA FAUST.